The Climate Academy 2022, 12-16Sep2022, online

Energy & Digital,
the Enablers for Climate Change

Josef Noll,

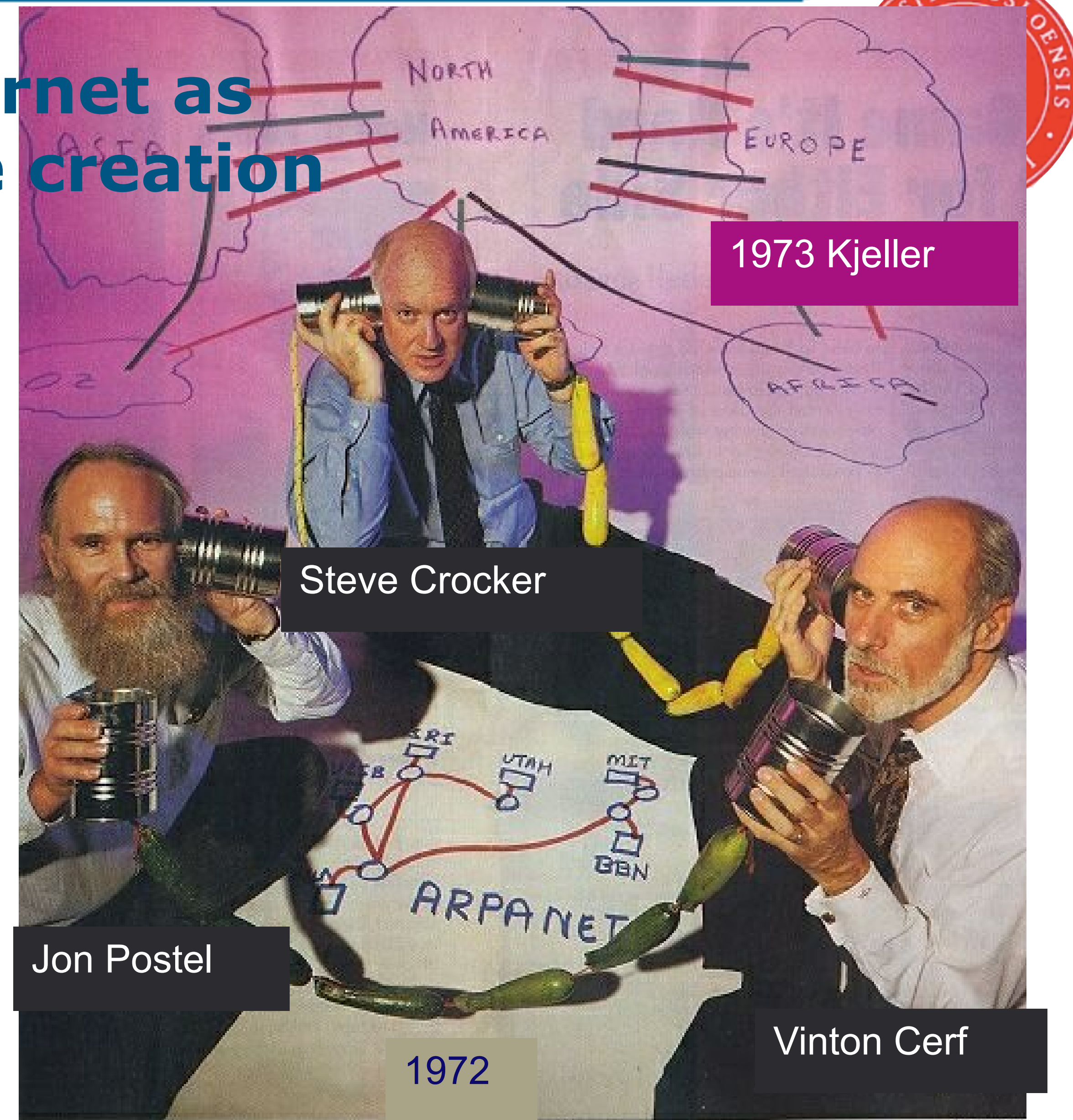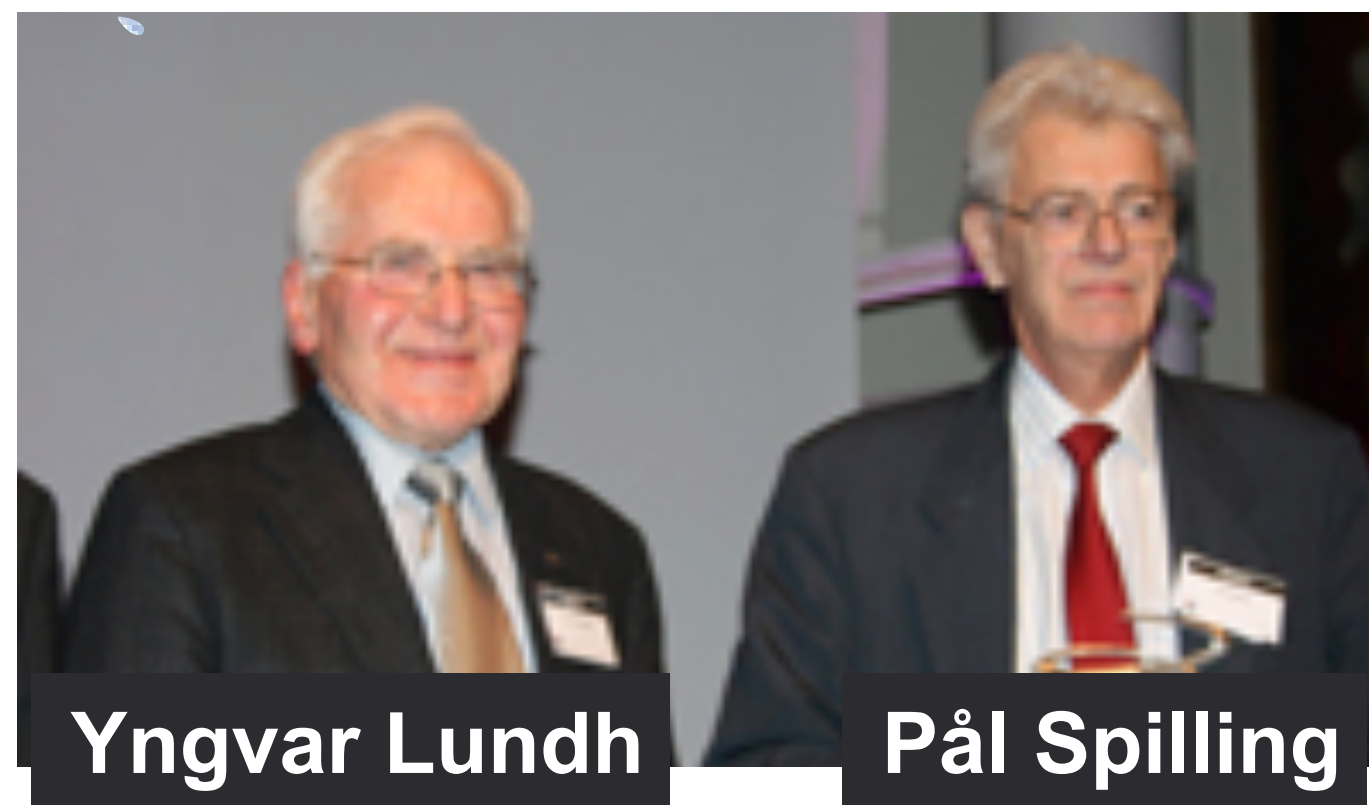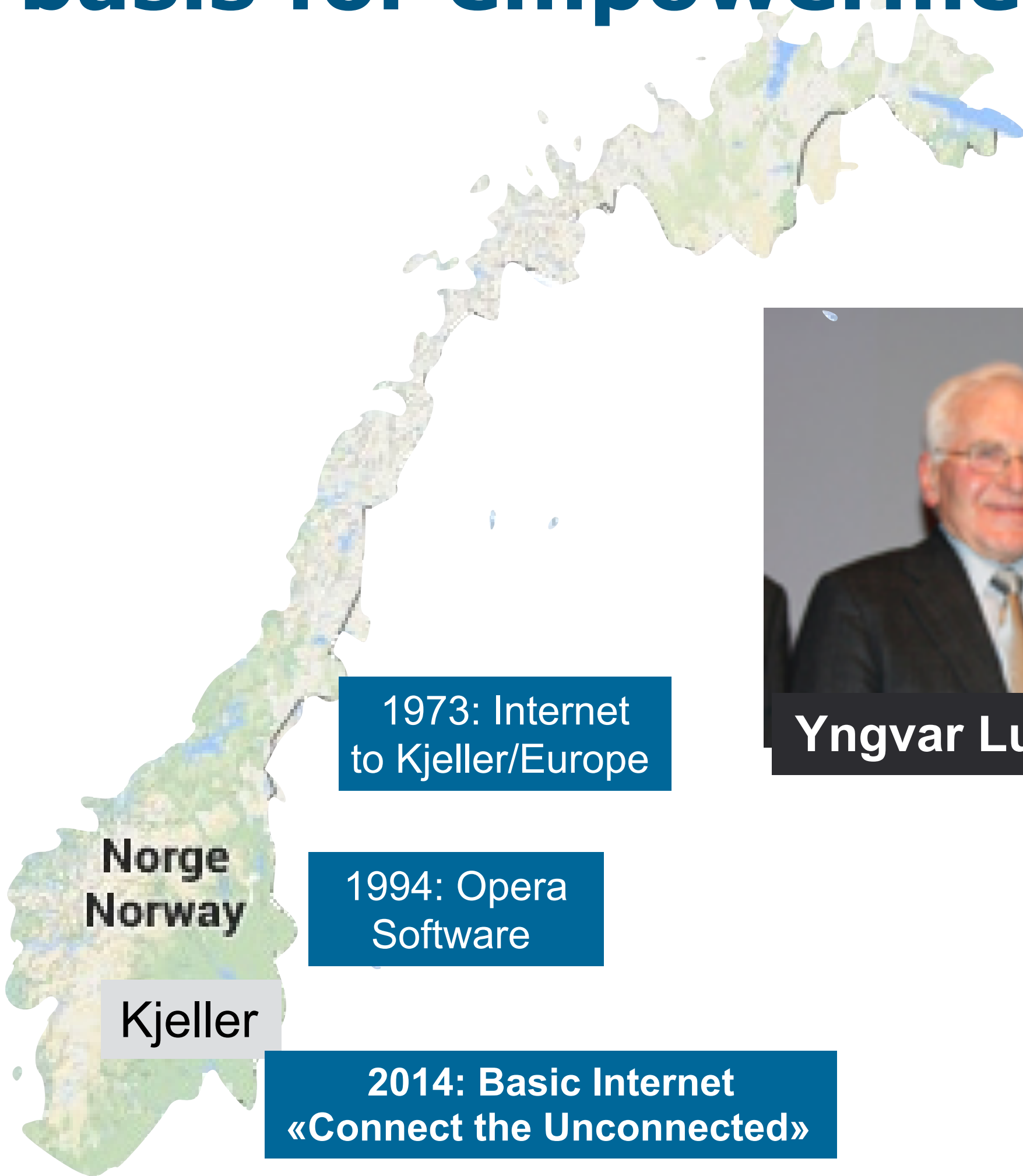Professor, University of Oslo, Department of Technology Systems

Kjeller, Norway, m: +47 9083 8066, e: josef@jnoll.net

An inclusive Next Generation Internet as basis for empowerment and value creation

1973 Kjeller

Steve Crocker

Jon Postel

Vinton Cerf

1972

Yngvar Lundh   **Pål Spilling**

1973: Internet to Kjeller/Europe

Norge Norway

1994: Opera Software

Kjeller

2014: Basic Internet «Connect the Unconnected»

Source: http://www.michaelkaul.de/History/history.html

Starting Point:

JOSEPH E. STIGLITZ

WINNER OF THE NOBEL PRIZE IN ECONOMICS

THE PRICE OF INEQUALITY
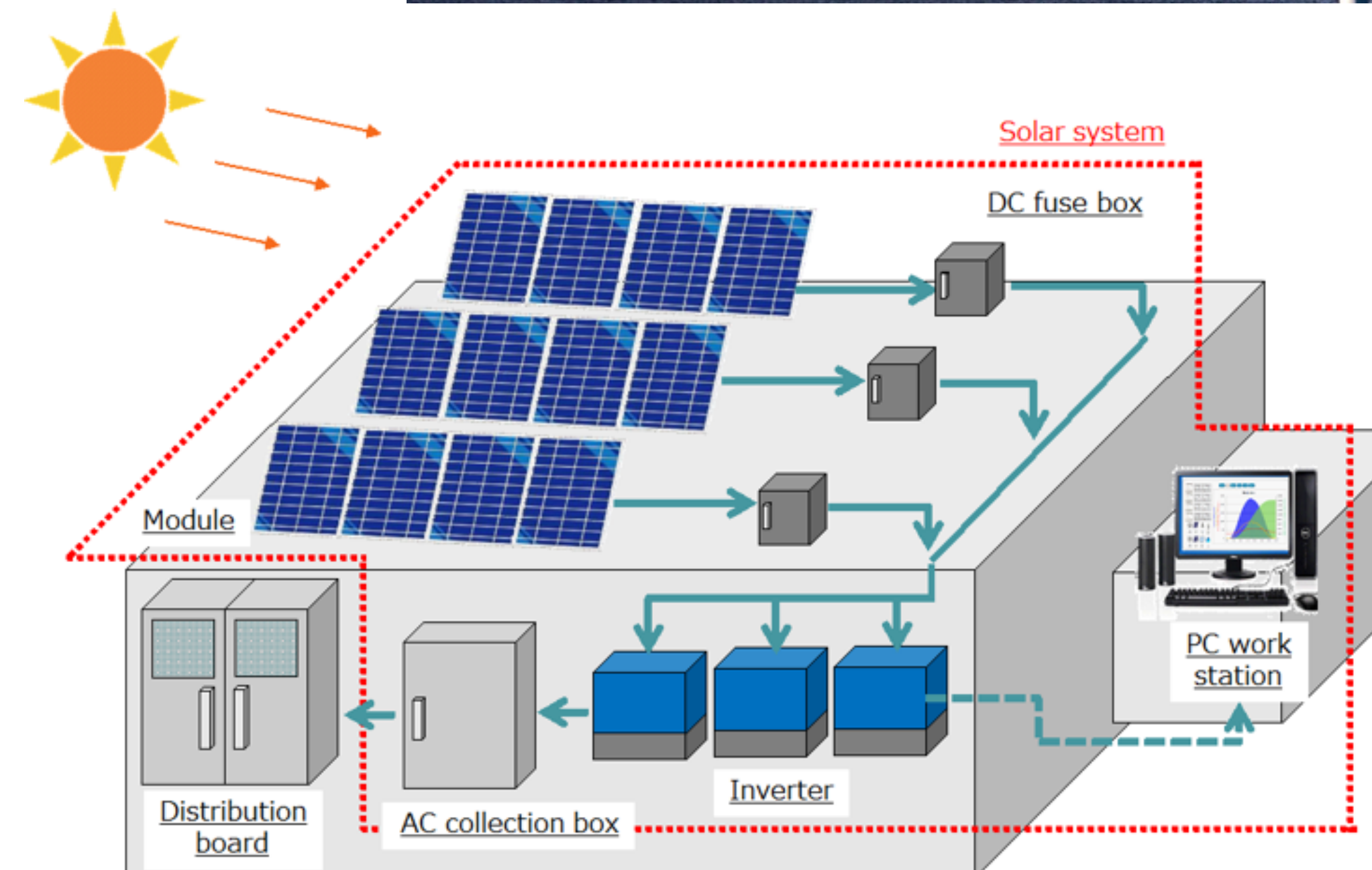
HOW TODAY'S DIVIDED SOCIETY ENDANGERS OUR FUTURE

From Power to Renewable Energy generation
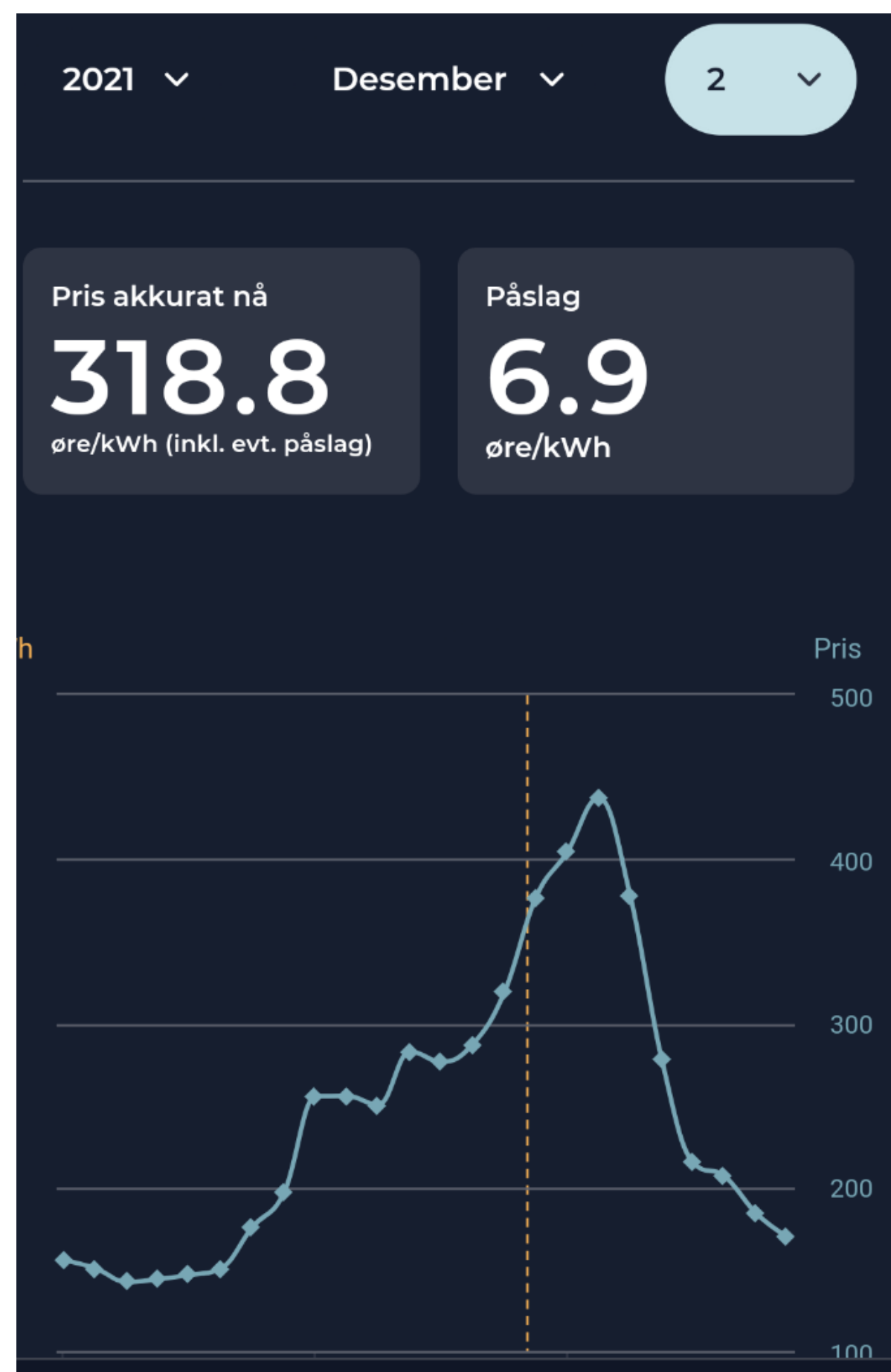
Renewable $\Delta t = 30sec...2min$

The "new normal" in energy

➡ Growth of Renewables
- variability

➡ Gas prices
- war, CO_2

➡ Climate Crisis
- unpredictable weather

➡ **High variation of electricity prices**

Prisvirkning av NordLink og NSL
Metode og oppdatert estimat

Mars 2022
Ivar Husevåg Døskeland, Anders Kringstad og Eirik Tømte Bøhnsdalen
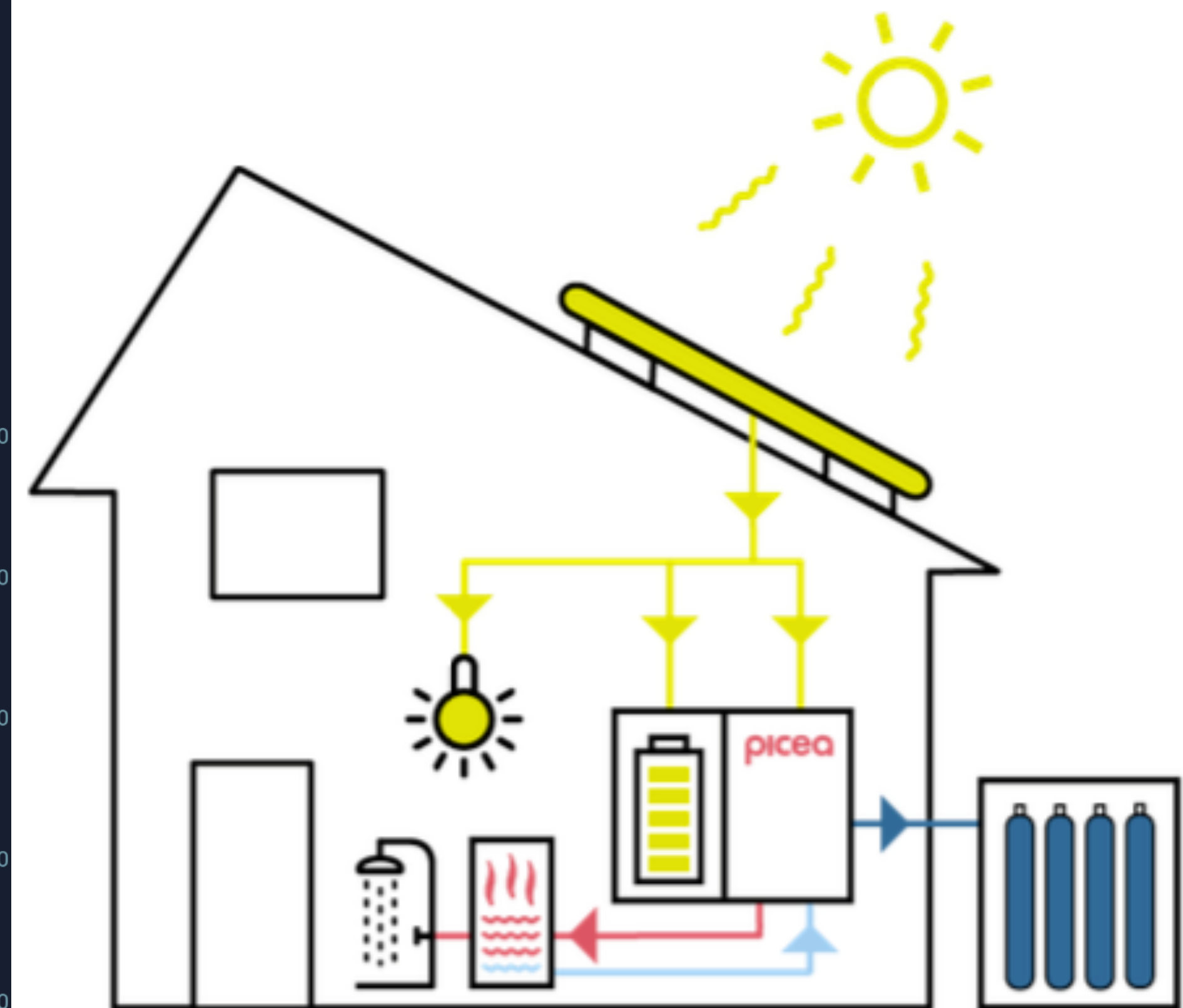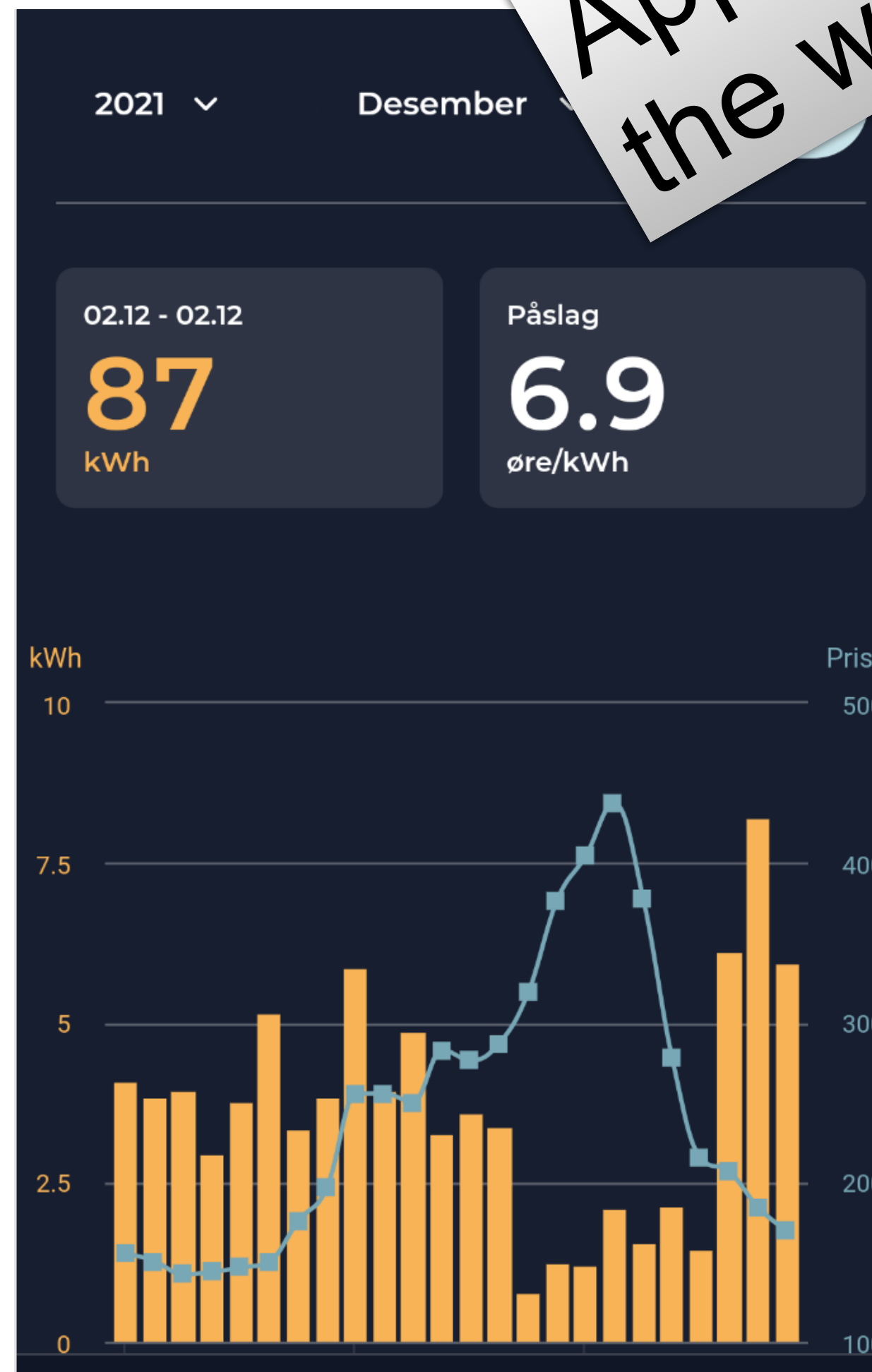
How can we adapt?

Applicable for the world?

➡ Empower the customer
  ▪ capability to adapt
  ▪ decentralised solutions
  ▪ distributed grid
➡ Upgrade houses
➡ Neighbour-networks

Sustainable Development Goals (SDGs)

Public Opinion on SDGs (afrobarometer.org)

➡ Priorities by people in Africa

- decent work
- zero hunger
- good health
- ...

SDG	Priority	Percent
8 DECENT WORK AND ECONOMIC GROWTH	decent work	57%
2 ZERO HUNGER	zero hunger	31%
3 GOOD HEALTH AND WELL-BEING	good health	27%
16 PEACE AND JUSTICE STRONG INSTITUTIONS	peace & jus	26%
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	industry	24%
6 CLEAN WATER AND SANITATION	clean water	24%
1 NO POVERTY	no poverty	22%
4 QUALITY EDUCATION	qual. edu	21%
7 AFFORDABLE AND CLEAN ENERGY	clean energy	13%
11 SUSTAINABLE CITIES AND COMMUNITIES		4%
13 CLIMATE ACTION		3%
10 REDUCED INEQUALITIES		2%
5 GENDER EQUALITY		1%

need to have

nice to have

https://blogs.worldbank.org/africacan/how-do-africans-priorities-align-with-the-sdgs-and-government-performance-new-results-from

How can Internet help us?

Josef Noll @josefnoll · Jun 2

Amazing opening by @ITU @ITUSecGen Houlin Zhao, setting the scene for connecting every single human by 2030, and @meilinfung, addressing the history of the Internet and #NRENs to connect schools. We're in @CateKimambo @RosalynnMworia @UcsafT @AheriNet @cisskisumu @WSISprocess

#1 Connect the Unconnected

Building blocks for empowerment

SDG 1.4 Equal access to basic services
SDG 4.A Education facilities for effective learning for all
SDG 5.B Use of enabling technologies
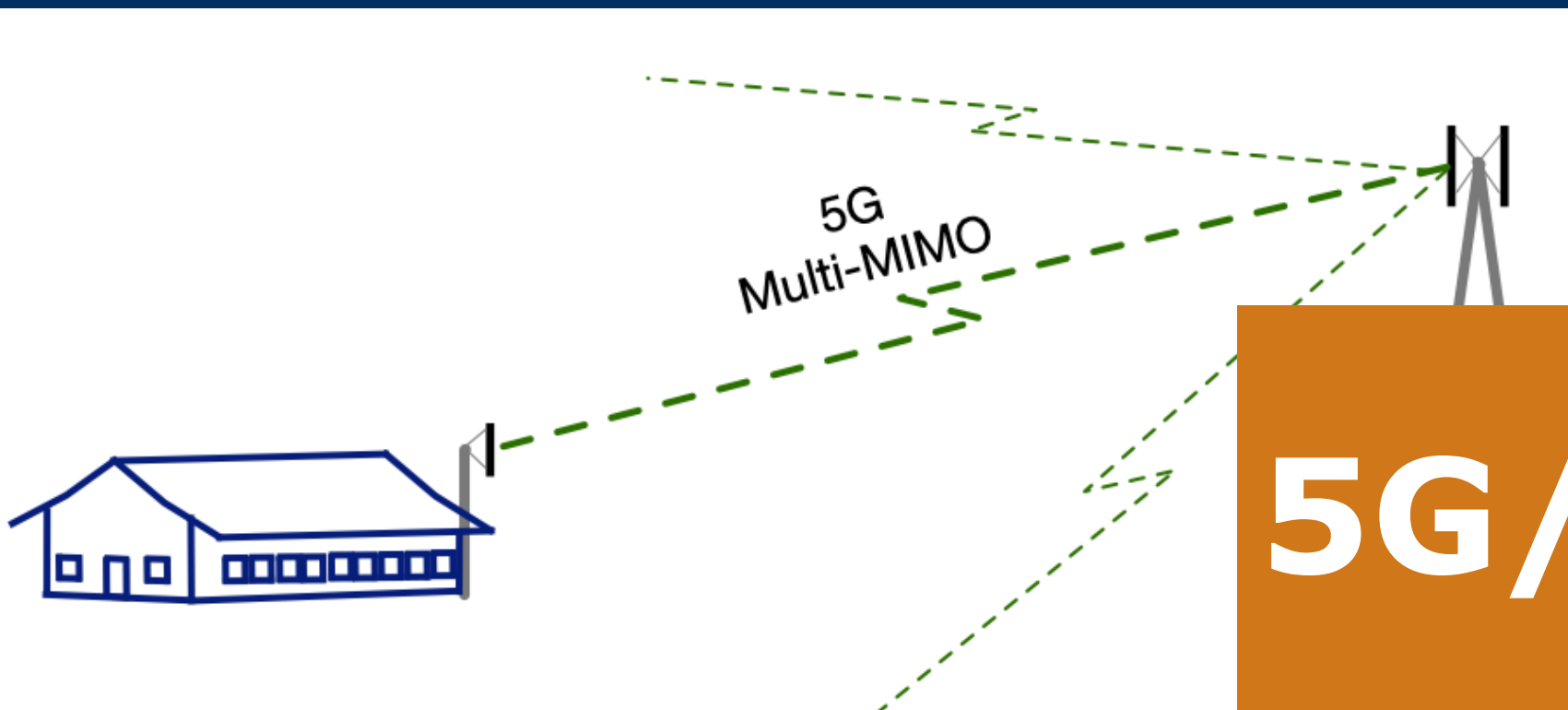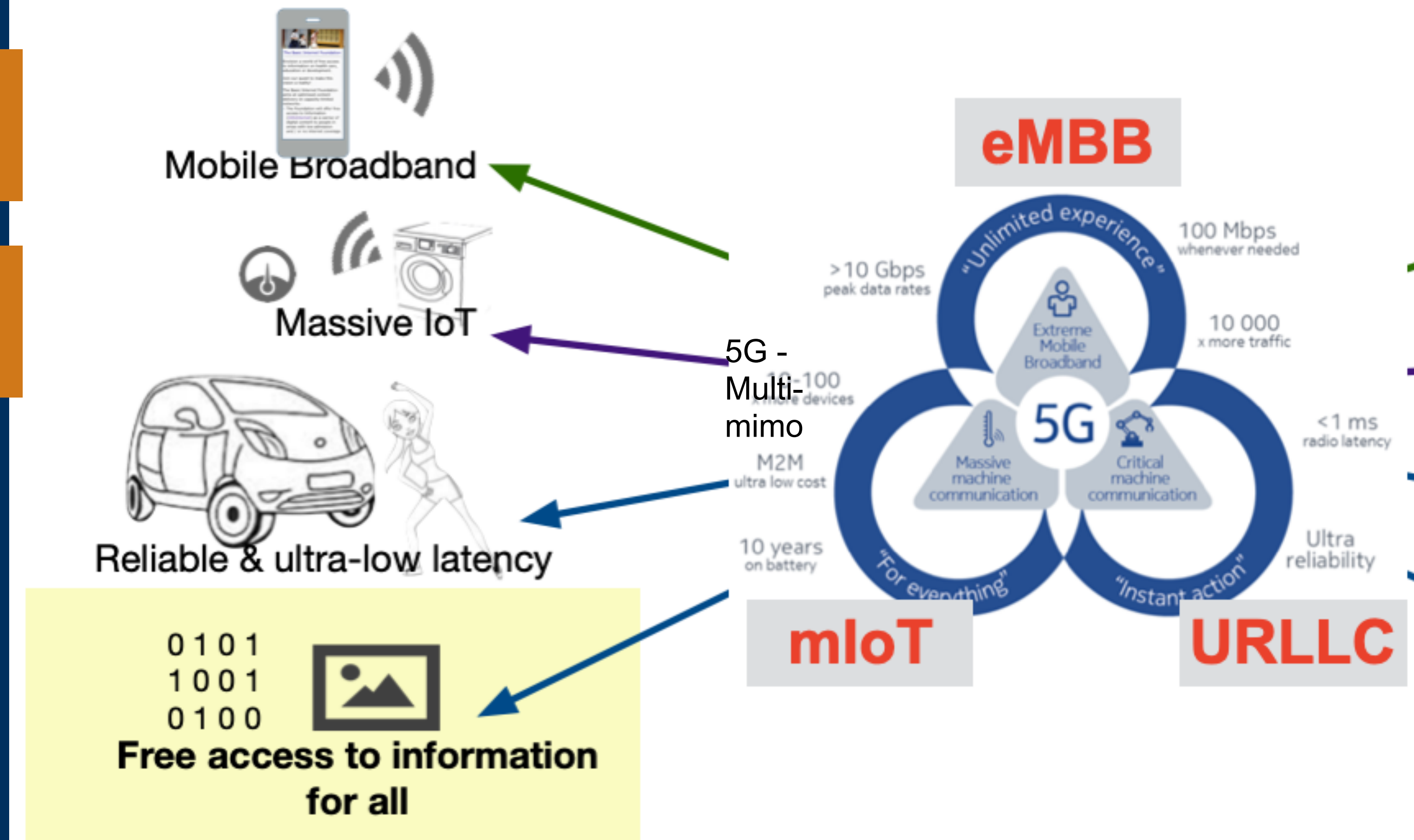**SDG 9.C** universal and affordable access
SDG 16.10 ensure public access to information

Digitisation (5G/6G)

Road model: pedestrians & cyclists

Internet: text & pictures

Mobile Broadband

Massive IoT

5G - Multi-mimo

Reliable & ultra-low latency

0101
1001
0100
Free access to information for all

eMBB

>10 Gbps peak data rates

"Unlimited experience"

100 Mbps whenever needed

10 000 x more traffic

Extreme Mobile Broadband

10-100 x more devices

5G

<1 ms radio latency

M2M ultra low cost

Massive machine communication

Critical machine communication

Ultra reliability

10 years on battery

"For everything"

"Instant action"

mIoT

URLLC

5G Multi-MIMO

5G/6G for school/village connectivity

Renewable Energy & Digitisation

People Society

battery

electrical vehicles

battery

MicroGrid

PhotoVoltaics

5G/6G

IoT

Artificial Intelligence

Machine Learning

waste 2 energy

Blockchain

Discussion:
Enablers to Climate Change

➡ Resilient Societies

  ‣ Pandemics: COVID-19,

  ‣ natural disaster,
    external threats: terrorism, fake news,

➡ Self-sustained communities

  ‣ job-creation, educating, energy,
    information

  ‣ value-based

➡ Building blocks for empowerment

  ‣ renewable energy & information

  ‣ access to Internet "Internet Lite"

People Society

Markus Brunnermeier,
Princeton University

Energy & Internet Lite for All
Target 7.1&7.2   Target 9.C   Target 16.10